REPLY: We thank Schiepers et al. for their comments on our article (*1*). Schiepers et al.'s publication on a similar topic (*2*) did not show the biphasic pattern of ^{11}C-acetate uptake that we saw in some patients. In response, we reviewed all the time–activity curves generated for our subjects both for tumor and for benign prostatic hyperplasia in the prostate, blood pool, and muscle volumes of interest. The summary data plots of the time–activity curves for ^{11}C-acetate uptake, as shown in Figure 1 of our article, are an average representation across all subjects. Within these data, we found 2 classes of uptake curves, as shown in the plots in Figures 1A and 1B of our article. One class clearly demonstrated a biphasic pattern (e.g., subject 36), whereas the other demonstrated a simple, irreversible uptake pattern (e.g., subject 28) more consistent with Schiepers et al. When averaged together, the biphasic pattern emerges.

Dr. Schiepers was correct in pointing out the complexity of our imaging protocol. As opposed to Dr. Schiepers' imaging method, which included the prostate throughout the duration of the scan, our imaging protocol included both the prostate and the lower abdomen so as to detect potential metastatic disease. This protocol required that we move the patient back and forth between the 2 scanning positions, first scanning the pelvis and then the lower abdomen, each for 2 min at a time. This technique can create subtle misalignments and other quantitation issues due to altered decay corrections and the inability of the reconstruction software to reproduce accurate SUVs. However, the latter issue is minor and is related mostly to rounding-off errors in entering the injection time.

The most challenging part of the imaging protocol was that the first 6 min of the scan were acquired in list mode; thus, we reconstructed the data in time frames, with the last time frame truncating the time–activity curve at 6 min. The prostate was then moved out of the field of view for the first lower-abdomen scan and then back into the field of view for the next 2-min scan at about 12–15 min after injection. The use of these time frames necessarily causes a sampling gap between 6 min and 12–15 min that would help confirm either a true biphasic pattern or an artifact due to the complicated nature of the imaging protocol. Another potential issue is that the dose used (1,480 MBq) was substantially higher than that used in the Schiepers study (370 MBq), thus causing potential SUV nonlinearities at early acquisition times.

To determine whether there were high rate effects or whether the complicated imaging protocol would lead to an artificial biphasic uptake curve, during the review of the time–activity data, fresh volumes of interest were drawn on hot-spot lesions in the prostate and in muscle tissue as a reference. If an artificial biphasic uptake pattern had been generated by either the high activity or the imaging protocol, it should have shown up in both prostate lesion and muscle tissue time–activity curves. Neither subject 36 nor subject 28 showed a biphasic pattern in the muscle time–activity curve, thus raising the possibility that the biphasic pattern is real and reflects actual metabolic differences among prostate cancers that may be of importance.

Regardless of the presence or absence of this biphasic pattern in the time–activity curve, the main conclusion of our paper remains the same: ^{11}C-acetate does not do a very good job in distinguishing between malignant tumors and BPH lesions. Because this is the major determinant of whether an imaging tool for localized prostate cancer succeeds, ^{11}C-acetate would not seem to pass this test.

REFERENCES

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